

MRI Safety Information Resources

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Shellock R & D Services, Inc.

www.MRIsafety.com c

Websites



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Radiation-Emitting Products

MRI (Magnetic Resonance Imaging)

- [Description](#)
- [Uses](#)
- [Risks/Benefits](#)
- [Information for Patients](#)
- [Information for Professionals](#)
- [Laws, Regulations & Performance Standards](#)
- [Industry Guidance](#)
- [Other Resources](#)

www.FDA.gov

ACR Homepage

[Joint Commission Issues MRI Sentinel Event Alert](#)

[ACR Guidance Document on MR Safe Practices: 2007](#)

[Updated ACR Screening Recommendations on Gadolinium-Based MR Contrast Agents, Renal Disease Patients, and Nephrogenic Systemic Fibrosis \(NSF\)](#)

[Institute for Magnetic Resonance Safety, Education, and Research](#)

[MRI Safety Web site](#)

[Safety Screening Form for MR Procedures \(Spanish Version\)](#)

[Initial FDA Public Health Advisory on Gadolinium-containing Contrast Agents - 6/8/06](#)

[Secondary FDA Public Health Advisory on Gadolinium-containing Contrast Agents - 12/22/06](#)

[Latest FDA Public Health Advisory on Gadolinium-containing Contrast Agents - 5/23/07](#)

[The International Center for Nephrogenic Fibrosing Dermopathy Research \(ICNFDR\)](#)

[RadiologyInfo - The radiology information resource for patients - Safety Magnetic Resonance Imaging \(MRI\)](#)

[MRI Quality Control Manual \(2004\)](#)

MR Safety

The ACR created a multidisciplinary blue ribbon panel to address critical issues in MR safety. Initially published in in the *American Journal of Roentgenology* in June 2002, updated in May 2004, and then markedly expanded and updated in March of 2007 (for June, 2007 publication in the *AJR*), the ACR Guidance Document for Safe MR Practices: 2007[™] addresses numerous MR safety related topics, such as:

Static magnetic field-related issues such as translational and rotational forces on ferromagnetic materials

Time-varying magnetic field-related issues such as induced voltage, auditory considerations, and thermal issues

Personnel qualifications and training

Site access restrictions

Pregnancy-related issues

Guidelines on claustrophobia, anxiety, sedation, analgesia, and anesthesia

Contrast agent safety, including an entire new section and recommendations regarding Nephrogenic Systemic Fibrosis, renal disease patients, and gadolinium administration

An entirely re-written section on the safety of MR scanning of device patients, such as patients with cardiac pacemakers, implanted auto-defibrillators, etc.

MR siting considerations

Emergency preparedness planning

[Joint Commission Issues MRI Sentinel Event Alert](#)

[ACR Guidance Document on MR Safe Practices: 2007](#)

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[RadiologyInfo - The radiology information resource for patients - Safety Magnetic Resonance Imaging](#)

ISMRRM



Patient Care and Safety

- [Brief overview for the public](#)
- [Information for Patients](#)
 - Patient video from IMRSE
- [Safety video for MR workers from IMRSE](#)
- [MR contrast agents – public comment on NSF](#)
- [Safety video for non MR workers from IMRSE](#)
- MR contrast agents
- [Regulatory issues for MRI in the UK \(and Europe\)](#)
- [Information for Patients](#)
- [Institute for Magnetic Resonance Safety, Education, and Research](#) – Frank Shellock
- [International MR Safety Central Web Site](#) – Emanuel Kanal
- [MRI Safety](#) – Frank Shellock
- [MR Safety & Patient Comfort](#) – GE Medical Systems
- [Nephrogenic Systemic Fibrosis or Nephrogenic Fibrosing Dermopathy \(NSF/NFD\)](#)
- [US Food & Drug Administration – MRI Safety](#)
- [US Food & Drug Administration](#) – Guidance for Industry (Issued 14 July 2003)
- [US Food & Drug Administration](#) – Public Health Notification (Issued 10 May 2005)

www.ISMRRM.org

Home

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Functions and
Activities

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Video Title (click title below to view video now)	Video Description
MRI Safety for MRI Professionals	In consideration of the critical components of a comprehensive MRI safety program, this lecture provides an overview of MRI bioeffects related to static, gradient (time-varying), and radiofrequency electromagnetic fields. Dr. Frank G. Shellock will discuss safety guidelines and recommendations developed for MRI facilities, terminology changes for implants and devices, and provide up-to-date information pertaining to implants that have undergone evaluation in the MRI environment. Information specific to scanners operating at 3-Tesla is included (one hour video).
What to Expect During Your MRI Exam	This 20 minute video is intended for patients and explains basic aspects of the MRI examination.
MRI Safety for Non-MRI Personnel	An MRI system uses a powerful magnetic field that is always on, even when the scanner is not in use. The magnetic field is invisible and can cause accidents, injuries, and damage to equipment if special precautions are not taken. Anyone who works in or around an MRI facility, or who may encounter the MRI environment in the event of an emergency, can prevent accidents and injuries by knowing basic information.
	This 15-minute presentation is intended for individuals who may encounter the MRI environment. This video will provide you with the basic safety information you need to know to avoid accidents and injuries in the MRI environment.

FREE!
MRI Safety
Training
Videos

www.IMR SER.org



YOUR INFORMATION RESOURCE
FOR MRI SAFETY, BIOEFFECTS,
AND PATIENT MANAGEMENT

MRIsafety.com

- ✓NO need to register, FREE to all site visitors
- ✓Information for all aspects of MRI safety
- ✓Thousands of implants/devices tested, including 3-Tesla
- ✓Many “electronically-activated” implants have MR labeling approved by the FDA
- ✓Email questions, as needed

[上一步: 部署 Web 应用](#)



ACKNOWLEDGMENTS

DISCLAIMER

WNC LIST

SAFETY INFORMATION

RESEARCH SUMMARY

SOURCE: MIMO, FORM

PRODUCT TESTING

ORDERING INFORMATION

LEADING

ABOUT DB SWIFT LOCK

PRIORITY E-MAIL



MRIsafety.com

- 3.0-Tesla MR Safety Information for Implants and Devices
- [AccuRx Constant Flow Implantable Pump and Duracath Intraspinal Catheter](#)
- [Acoustic Noise and MRI Procedures Actipatch](#)
- [Activa \(Neurostimulation\) System \(Medtronic, Inc., Minneapolis, MN\)](#)
- [Aisius Intravascular Temperature Management](#)
- [Aneurysm Clips](#)
- [Baha, Bone Conduction Implant](#)
- [Bioeffects of Gradient Magnetic Fields](#)
- [Bioeffects of Radiofrequency Fields](#)
- [Bioeffects of Static Magnetic Fields](#)
- [Biopsy Needles, Markers and Devices](#)
- [Body Piercing Jewelry and MRI Safety](#)
- [Bone Fusion \(Spinal\) Stimulator](#)
- [BRAVO pH Monitoring System](#)
- [Breast Tissue Expanders and Implants](#)
- [Cardiac Pacemakers and Implantable Cardioverter Defibrillators \(ICDs\)](#)
- [Cardiovascular Catheters, Other Catheters, and Accessories](#)
- [Carotid Artery Vascular Clamps](#)
- [Cerebral Control System](#)
- [Miscellaneous Implants and Devices](#)
- ["Missile Effect" Accidents and Prevention](#)
- [Monitoring Patients in the MR Environment](#)
- [MRI Contrast Agent Safety](#)
- [MRI Contrast Agent: Magnevist - Product Insert Information](#)
- [MRI Contrast Agent: MultiHance - Product Insert Information](#)
- [MRI Contrast Agent: Omniscan - Product Insert Information](#)
- [MRI Contrast Agent: ProHance - Product Insert Information](#)
- [MRI Contrast Agents and Adverse Reactions](#)
- [MRI Contrast Agents and Breast Feeding Mothers](#)
- [MRI Contrast Agents and Nephrogenic Systemic Fibrosis \(NSF\)](#)
- [MRI Contrast Agents and Nephrogenic Systemic Fibrosis \(NSF\): Review Article](#)
- [MRI Contrast Agents and NSF: Websites and Links to Obtain Current Information](#)
- [MRI Contrast Agents and Pregnant Patients](#)
- [MRI Information for Patients](#)
- [MRI Issues for Hemodynamic](#)

The Role of the FDA

- ✓ Help increase awareness of MRI safety issues
- ✓ Update and add information including links to FDA website

Textbooks

Shellock FG, Kanal E. MAGNETIC RESONANCE: BIOEFFECTS, SAFETY AND PATIENT MANAGEMENT. Raven Press, New York, 1994 and 1996; *Two editions*

Shellock FG. GUIDE TO MRI PROCEDURES AND METALLIC OBJECTS: UPDATE 1994. Raven Press, New York, 1994 – 2001; *Seven editions*

Shellock FG. MAGNETIC RESONANCE PROCEDURES: HEALTH EFFECTS AND SAFETY. CRC Press, Boca Raton, FL, 2001.

Shellock FG. REFERENCE MANUAL FOR MAGNETIC RESONANCE SAFETY, IMPLANTS, AND DEVICES: 2004 EDITION. Biomedical Research Publishing Group, Los Angeles, CA, 2002 to 2011; *Ten editions, new edition each year*

Summary – Role of the FDA

- ✓ Sponsor MRI safety workshop or other meeting
- ✓ Conduct research to identify areas that are problematic or that need improvement
- ✓ Advise and educate the MRI community (i.e., like paper from Hardy and Weils)
- ✓ Develop in-house standards for MRI labeling and disseminate to all FDA reviewers
- ✓ Help to increase awareness of MRI safety issues
- ✓ Update and add information and links to FDA website



Thank you!